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Choice of retention systems for Maxillofacial Prostheses among dental professionals in Pondicherry–A Cross sectional study

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Abstract:

Background: Maxillofacial prostheses (MFP)are a boon to the severely debilitated patients affected with congenital defects, trauma or tumor in the facial region where reconstruction of lost structures is impossible by surgical intervention. Increasing the retention of the prostheses with various retention aids provides both ease of use and acceptance by the patient. However, choice of retention system for a particular patient often is not given much importance due to lack of adequate knowledge (with regards to indications, types and selection of clinically suitable retention systems) by the dental professionals. Hence the aim of this study was to assess the choice based on knowledge, attitude and practice regarding retention systems for MFP among dental professionals in Pondicherry.

Aim: To assess the Knowledge, attitude and practice among dental professionals regarding retention systems for Maxillofacial Prostheses in Puducherry.

Materials and methods: The URLs of the online questionnaire were shared via e-mail to dental practitioners of Pondicherry which focused on knowledge, attitude and practice of retention systems in MFP.
Statistical analysis was done using counts and percentages and the results were further analyzed statistically by the ANOVA test.
Results: It was found that majority of the dental practitioners were not aware about aspects of retention systems for Maxillofacial Prosthesis.
Conclusion: The choice of various retention systems in treatment planning for maxillofacial prostheses differed with regard to the participants, field of expertise and work environment. The lack of knowledge among the dental practitioners can be improved by continuing dental education programs highlighting awareness about MFP and retention systems.
Key words: Awareness, Multidisciplinary team, Maxillofacial prosthesis, Prosthodontist, Retention systems.

INTRODUCTION:

Oral and maxillofacial defects lead to deformities causing stress and depression of an individual affecting mental and physical wellbeing thereby compromising the quality of life. Moreover, deformities in oral and maxillofacial region presents with speech impediment and impairment in mastication and deglutition as complex aesthetic units such as eyes, ears and nose are predominantly involved.[1]This state often necessitates prosthetic rehabilitation which not only restores speech, mastication and deglutition but also oro-facial appearance and functional occlusion.
Prostheses are artificial materials that functions or looks like an organ or organ group that were missing due to causative factors such as congenitally missing, trauma or tumour.[2]First two factors may be common to both genders but cancers are more prevalent in elderly patients, with men having a threefold higher prevalence than women.[3]A prosthesis can be retained in four ways such as anatomically, mechanically, surgically or by adhesion.[4]Prior to 1979, adhesives were generally used to keep craniofacial prosthesis in place. Adverse skin reaction, loss of adhesion owing to perspiration and substantial tissue coverage to promote retention are some of the challenges and limitations are commonly associated with adhesives.[5]Of late osseointegrated implants have been used extensively to improve the retention of facial prostheses over the last two decades.[4]
Dental implants are frequently used to aid in the rehabilitation of patients with head and neck tumors following surgery and radiotherapy. Osseointegrated implants have been used successfully in patients who have had vascularized and non-vascularized bone, soft tissue grafts involving jaws and facial skeleton. Advancement in technology leads to development of implant-retained prostheses, which help to boost self-esteem, body satisfaction as well as improve overall quality of life, by improving the support and retention of removable prostheses.[6]
In general, plastic surgery or prosthetic rehabilitation must be undergone depending upon the age, size and level of defects, causative factors, gravity, prognosis and affordability of the patient.[7]Hence this

treatment necessitates a team in which the Prosthodontist as a member of the team, works in co-ordination with interdisciplinary specialties which includes speech therapy, psychology, psychiatry, physical therapy plans the design of the prosthesis,that functionally restores the lost function and improves the aesthetics. [8] The Prosthodontist takes up a lead role in this rehabilitation owing to his knowledge of anatomy, physiology and pathology, as well as his expertise and experience in using materials that are compatible with the patient's remaining tissues, thus fulfilling the objectives of a maxillofacial prostheses.[7]

In clinical settings, most of the time a Prosthodontist is involved in the treatment at a later time (after surgery). Due to lack of awareness of the referring dentist regarding the importance of selection of mode of retention prior to referral for surgery, the Prosthodontist is constrained by movable tissue beds, difficulty in retaining large prostheses, insufficient material for facial restorations, and the patient's willingness to accept the final result.

Therefore, the aim of the current study, was to assess the knowledge, attitude and practices(KAP) regarding retention systems for Maxillofacial Prostheses among dental professionals in Puducherry.

MATERIALS AND METHODS:

The present study is a cross sectional study among dental professionals working in Government/Private Medical and Dental colleges and hospitals and private dental practitioners in Pondicherry (Pondicherry region).Registered dental practitioners with BDS and MDS degree or post graduates pursuing MDS degree were included in the study and practitioners who were not willing to participate, who did not respond within the stipulated time and practitioners not residing/working/ practicing in Pondicherry were excluded from the study. The study was initiated after getting IEC approval (No: 19/SVMCH/IEC-22).

Study design

This questionnaire based online survey (observational study) was conducted from may to june 2022.

Sample size

Sample size calculation was done using Survey Sample Size Calculator (95% confidence interval) with 5% margin of error. Sample size was calculated as75 among the 300 dentists enrolled in Indian Dental Association in Pondicherry.

Participants and questionnaire

A database of register dentists was collected from Indian Dental Assosiation-Pondicherry, and their experience were noted. Selection was made using systematic random sampling and every 4th dentist from the IDA member list was selected for the study to reach the sample size of 75. A structured questionnaire with 15 closed ended questions was prepared by the authors. It was validated by subject experts for face and content validity which included relevance, clarity and completeness of each question in accordance with the aim of the study and it had good internal consistency (Cronbach -alpha

score=0.941). The questionnaire was then administered using Google Forms; the link for the same was sent to all the participants through whatsapp.

The questionnaire comprised of two sections. The first section assessed the demography of the respondents- age, gender, and years of experience in the profession, type of practice, academic association and location of practice. The second section assessed the Knowledge, Attitude and Practice of the participants towards the retention system of maxillofacial prosthesis.

Statistical analysis

Data from the Google Forms was analyzed using Statistical Package for the Social Sciences (SPSS), version 17.0 software (IBM SPSS, IBM Corporation 1, Armonk, New York, United States). Simple descriptive statistics were used to define characteristics of the variables using numbers and percentages for categorical variables. To establish a relation between categorical variables, we used the Chi-square test, where $p < 0.05$ was taken to indicate statistical significance.

RESULT:

This study aimed to assess the level of knowledge, attitude and practice among dental professionals regarding retention systems for Maxillofacial Prostheses in Pondicherry. There wasgender discrepanciesof KAP among the dental professionals (females-56% than males- 44%). Age group shows remarkable KAP among younger generation dentists namely 86% within 21-30 years, compared to 11% and 4 % from 31-40 years and 41-50 years respectively. However, 81% participants have experience of less than 5 years, 13% and 7% within the range of 5-10, more than 10 years. Participant's KAP was slightly lower than the midpoint and most of the MFP cases were referred to either institutions or hospitals.Participants who worked in institutions had more KAP than those who work in private clinics.

80% of the participants stated that their knowledge towards various retention aids in MFP was fromtext books or presentations. However, 79% of them attributed their knowledge about orbital and ocular defectsto social media rather than text books.There was 50-50% response for choice of material for patients with cranial defects and also for awareness about choice of velopharyngeal prosthesis for defective soft palate which revealed ignorance level when it comes to applied knowledge. Also, they had not consulted Prosthodontists in such cases and had referred to higher centers. 70% of the participants responded for surgical closure for treatment towards cleft lip and palate which showed that they were not aware about option of feeding plate or prosthodontics management to manage such cases in day-to-day practice before surgical intervention.

With regard to attitude towards retention system in MFP, almost 77% gave positive response for rehabilitation of maxillofacial defects. Also, 74% of them were aware of usage of pterygoid and zygomatic implants and magnets as retention aid; and information that retention of adhesive decreases over time.

80% of them were aware from textbook that Guiding flange prosthesis is widely recommended

treatment option for patients with sunken cheeks and deviation following hemimandiblectomy for optimal occlusion, however they had not referred such patients for Physiotherapy and for guiding flange appliance to Prosthodontists post hemimandiblectomy. However, despite their lack of application of involving Prosthodontist for such cases in day to day practice, 80% felt need of dentist to be included as part of multidisciplinary team [MDT] in rehabilitation of patient with maxillofacial defects. This is being stressed and stated in literature off late for better prognosis and overall, wellbeing of the patient. The participants gave 50-50% response for referral to higher institutions and centers or calling consultants for treatment planofpatients with maxillofacial defects.

Majority of practitioner were not clear about referral of patients with maxillofacial defects to a Prosthodontist or Plastic surgeon or Prosthetist. They were also not aware on materials to be used for soft tissue replacement in maxillofacial prosthesis(acrylicor medical or industrial gradesilicone). They had not given much attention to usage of either undercuts, adhesive or peripheral seal as best mode of retention for obturators in maxillary defects and usage of spectacle with adhesive or undercut with adhesive or implantsfor retaining nasal and auricular prosthesis.There was also lack of clarity on ideal impression material for making impression in maxillary defects and therefore choice was based on individual practitioner's preference or available material.

DISCUSSION:

The present study aimed to assess the level of knowledge, attitude and practice among dental professionals regarding retention systems for Maxillofacial Prostheses in Pondicherry. The available literature on this topic is limited and need of the hour as other dental professionals have to be made aware about the involvement of the Prosthodontist early in treatment planning for MFP patients.

Our study revealed that knowledge of dental professionals with respect to mode of retention was limited and was attributed to that from text books. This shows that there was less or nil clinical insight in MFP.Comprehensive understanding and clinical application of Prosthodontic rehabilitation of maxillofacial defects among undergraduate students was found to be lacking. This awareness should be initiated at an early stage of the clinical training for undergraduate training program, as it will help to understand the basic aspects involved in the Prosthodontic rehabilitation of maxillofacial defects.[9]

The dental professionals were ignorant about choice of material for MFP patients and various treatment options available rather than surgical option.A study evaluating the prevalence of maxillofacial injury, conducted by Singaram M et al., showed that maxillofacial fractures accounted for 93.3% of total injuries. This clearly emphasises the need for the future dentists to be equipped with a basic knowledge on maxillofacial defects.[10]

Our study revealed that still there is need for understanding among dental professionals that Prosthodontist play a major role as part of MDT team for managing MFP. This is also supported by

the question on the specialist where the patient should be referred for rehabilitation. Even though the majority has stated it to be OMFS, half of the study population has also stated it to be a Prosthodontist. While a Prosthodontist plays a crucial role in the treatment planning and approach, the initial referral is always to an OMFS.[11]

Our study revealed that there are a lack of cases in educational institutions (unless they are in proximity to higher centers) as the referring dental professionals are not aware that they should involve Prosthodontist at an early stage during treatment plan. However, the knowledge of dental undergraduate students regarding the same is better in comparison to the medical professionals, as proven in a study conducted by Vadepally A et al, where it was found that only 3% of medical professionals opted for OMFS in the referral of cases of cleft lip and palate, and associated craniofacial syndromes.[12]

In our study majority of the participants were aware about various retention aids in maxillofacialprosthesis from textbooks, this is in contrary to the findings by Karthikeson P.S.,et al.[12]Majority of the participantsin our studywere awareabout orbital and ocular defects, this is similar to the finding by Alani A et al.[13]This could be attributed to more emphasis to be given on maxillofacial prosthesis cases being taken up by Institutions and more online webinars on the topic.
In our study 50% of participants responded thatautologous bone graft is the best material of choice for patients with cranial defects. This is similar to finding by Kumar et al.[14] The awareness of involving Prosthodontist early in managing MFP cases, by exposing the undergraduate students to management of MFP cases in form of Institutional case presentations or attending online webinars at institute, state and national levels.
The limitation of the study was that we did not involve views of multidisciplinary team managing maxillofacial cases on this aspect. Further studies are needed with larger sample sizes among dental professionals on a national level to increase the information on this study.

CONCLUSION:

Most dental professionals had limited knowledge towards treatment and retention aids for MFP which was therefore not transferred to their practice. Therefore, there is a need to increase the awareness regarding the various retention systems and aspects of maxillofacial prosthesis required in managing cases in routine practice.

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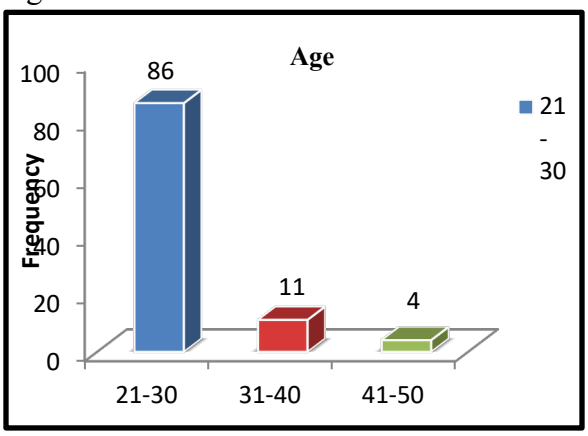
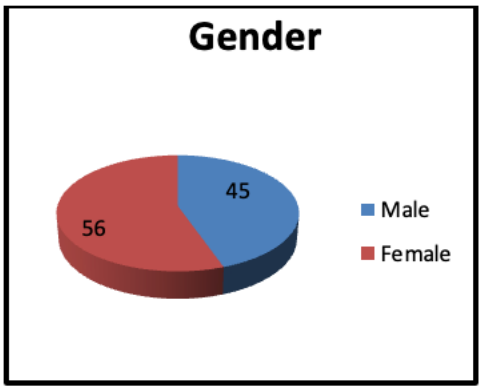
FIGURES

Figure-1





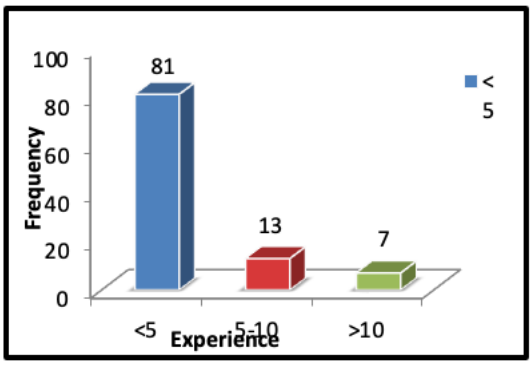
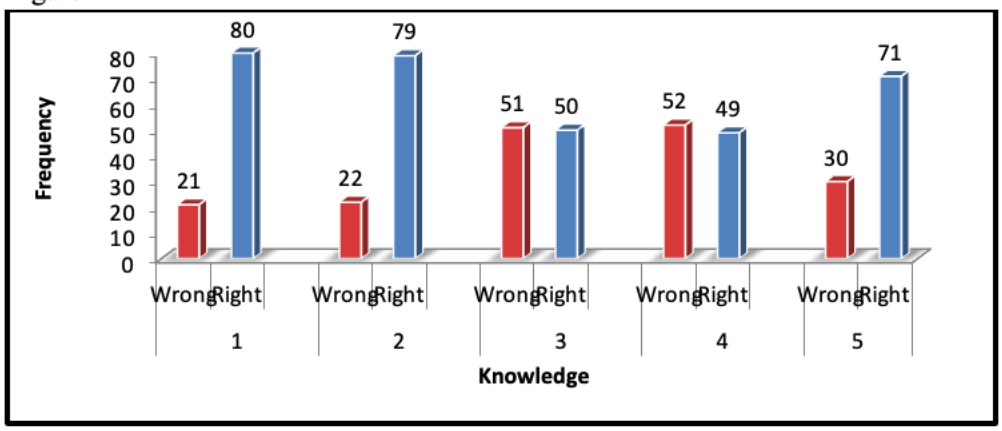


Figure-3

Figure-4



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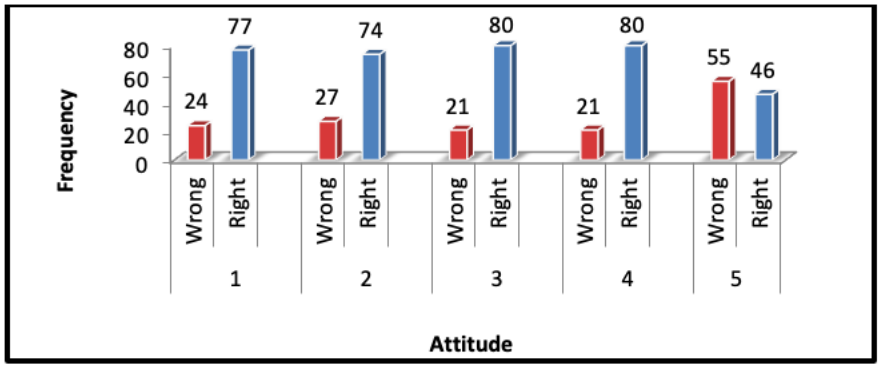

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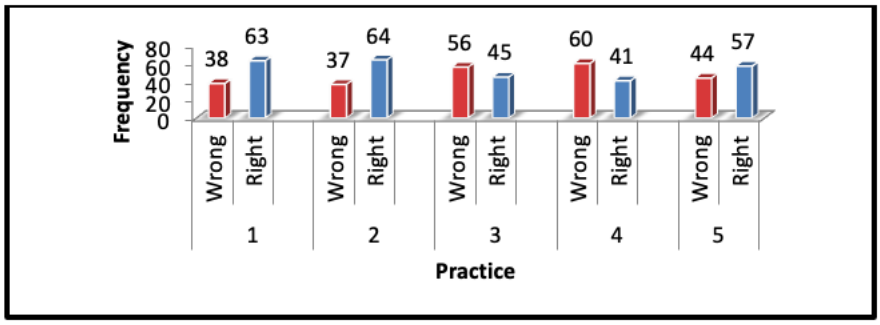

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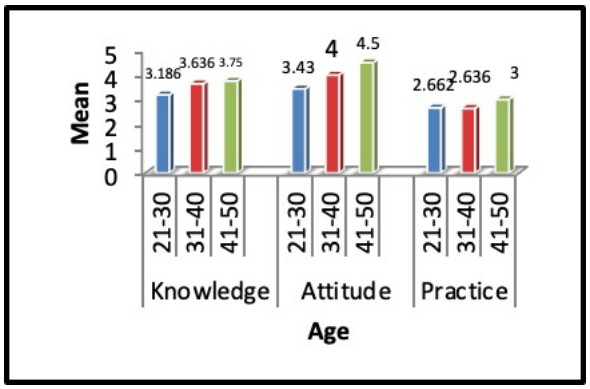

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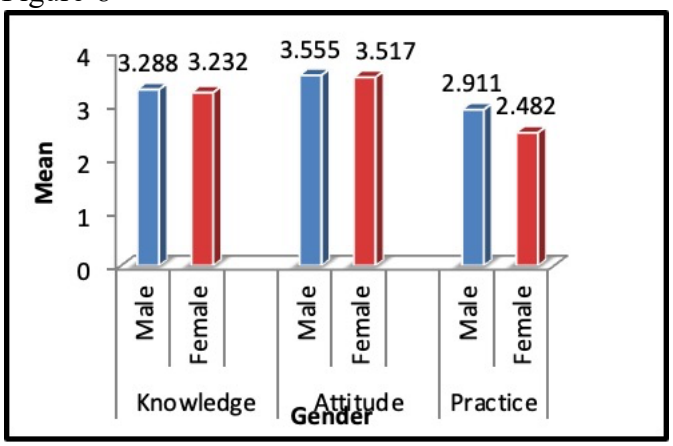
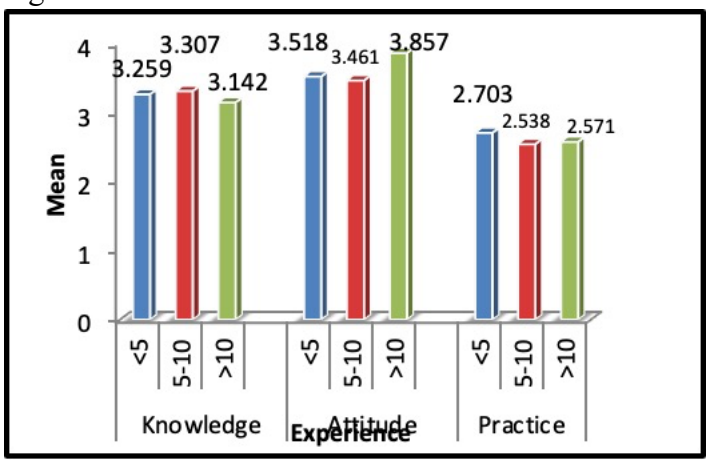


Figure-9



LEGENDS

Figure 1-Age of the participants
Figure-2-Gender of the participants
Figure-3-Experience of the participants
Figure-4-Knowledge of the participants
Figure-5-Attitude of the participants
Figure-6-Practice of the participants

Figure-7 Relationship of Knowledge,Attitude and Practice with age of the participants
Figure-8 Relationship of Knowledge,Attitude and Practice with gender of the participants
Figure-9 Relationship of Knowledge,Attitude and Practice with experience of the participants

Table-1-QUESTIONNAIRE

1	Are you aware of various retention aids in maxillofacial prosthesis?
2	Are you aware of orbital and ocular defects?
3	Which is the best material of choice for patients with cranial defects?
4	Are you aware of velopharyngeal prosthesis in management of soft palate defects?
5	Which is the best treatment option for treating patients with cleft lip and palate?
6	Do you refer patients with maxillofacial defects for rehabilitation?
7	What is your choice of retention aid If patient has huge defects?
8	What is your treatment option for patients with complaints of sunken cheeks and deviation following hemimandibulectomy?
9	Do you think dentist must be included as part of multidisciplinary team [MDT] in rehabilitation of patient with maxillofacial defects?

10	What is your treatment plan when you come across patient with maxillofacial defects?
11	If referred, to whom do you refer patients with maxillofacial defects?
12	Which type of material do you use for soft tissue replacement in maxillofacial prosthesis?
13	Which is the best mode of retention for obturators in maxillary defects?
14	which method do you prefer for retaining nasal and auricular prosthesis?
15	What is your material of choice for making impression in maxillary defects?